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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,149	04/17/2007	Elliot L. Chaikof	11-04	1649
23713	7590	08/06/2009	EXAMINER	
GREENLEE WINNER AND SULLIVAN P C 4875 PEARL EAST CIRCLE SUITE 200 BOULDER, CO 80301			ROBINSON, HOPE A	
			ART UNIT	PAPER NUMBER
			1652	
			MAIL DATE	DELIVERY MODE
			08/06/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/598,149	CHAIKOF ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	HOPE A. ROBINSON	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 02 April 2009.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20,23 and 24 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-5,16-20,23 and 24 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 02 April 2009 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____ .

## **DETAILED ACTION**

### ***Application Status***

1. Applicant's response to the Office Action mailed October 3, 2008 on April 2, 2009 is acknowledged.

### ***Claim Disposition***

2. Claims 1-20 and 23-24 are pending. Claims 1-5 and 16-20 and 23-24 are under examination. Claims 6-15 are withdrawn from further consideration pursuant to 37 CFR 1.12(b), as being drawn to a non-elected invention, there being no allowable generic or linking claim.

### ***Claim Objection***

3. Claims 1 are objected to because of the following informalities:

For clarity and precision of claim language, it is suggested that claim 1 is amended to read, "said truncated thrombomodulin protein derivative" in lieu of "said protein derivative". In addition, claim 1 is objected to because the acronym "EGF" does not appear with the spelled out meaning.

For clarity it is suggested that claim 2 is amended to read, "corresponding to the M amino acid residue of SEQ ID NO:X".

For clarity it is suggested that claim 3 is amended to read, "a truncated thrombomodulin protein comprising the amino acid sequence of SEQ ID NO:3".

For clarity it is suggested that claim 16 is amended to read, "A thrombomodulin protein derivative-PEG conjugate".

Claim 17 is objected to because the acronym "PEG" does not appear with the spelled out meaning.

For clarity claim 20 should be amended to read, a catalytic active site".

For consistency claims 20 and 21 should be amended to read, "truncated thrombomodulin protein derivative".

Correction is required.

### ***Drawing***

4. The drawings filed on April 2, 2009 are accepted by the examiner.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims recite added material, which is not supported by the original disclosure. Claims 1, 4 (and dependent claims 1-14 and 16) recite "leucine for methionine" and the instant specification discloses leucine is substituted for methionine at position 388 and not at other positions in sequence set forth in SEQ ID NO:3. It is noted that SEQ ID NO:3 has 147 residues thus does not have a position 388 as previously recited in the claims and is presently disclosed in the instant specification. Therefore, the specification lacks adequate written description.

6. Claims 1-5 and 16-20 and 23-24 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claimed invention is directed to a truncated thrombomodulin protein derivative and a truncated thrombomodulin protein derivative conjugated to a polymer, comprising a substitution of a Leu for a Met, however, the claims do not set forth what position in the structure of SEQ ID NO:3 the substitution will take place (see for example

claims 1 and 4). Moreover, SEQ ID NO:3 has a Met in position 147, however, the instant specification discloses a substitution of Leu to Met at position 388 and the structure in SEQ ID NO:3 only has 147 residues, thus no position 388 is present. Further, the claims are drawn to a non-natural amino acid corresponding to the M amino acid residue (see claim 2 for example), however, there is no indication of where in the structure this residue is. Furthermore, claim 20 is directed to any non-natural amino acids. Additionally, the claimed invention encompasses a genus of polymers. Note that claims such as 4 and 16 recite, "polymer" which encompasses a protein or a nucleic acid etc. (see also claim 23). Further, claim 16 recites "a conjugate of a thrombomodulin protein or a thrombomodulin derivative and a polymer, wherein said conjugate comprises SEQ ID NO:3", and claim 1 recites, "a truncated thrombomodulin protein derivative ...comprising SEQ ID NO:3", thus the recited conjugate and protein only are given the same structure in the claims.

In addition, the invention is directed to a genus of mimetics for the recited linear or branched polymers (see for example claim 24). The specification fails to provide any additional representative species of the claimed genus to show that applicant was in possession of the claimed genus. A representative number of species means that the species which are adequately described are representative of the entire genus. The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, disclosure of drawings, or by disclosure of relevant identifying characteristics, for example, structure or other physical and/or chemical properties, by functional

characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus.

Accordingly, in the absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the claimed genus. Further, *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 *USPQ2d* 1111, 1117 (Fed. Cir. 1991), states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the *invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*" (See page 1117). The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed" (See *Vas-Cath* at page 1116). The skilled artisan cannot envision the detailed chemical structure of the encompassed genus of polypeptides, and therefore, conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required. See *Fiers v. Revel*, 25 *USPQ2d* 1601 at 1606 (CAFC 1993).

Therefore, for all these reasons the specification lacks adequate written description, and one of skill in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

7. Claims 1-5 and 16-20 and 23-24 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter, which applicant (s) regard as their invention.

Claims 1-5 and 16-20 and 23-24 are indefinite for the recitation of "truncated thrombomodulin protein derivative comprising SEQ ID NO:3" and a thrombomodulin protein derivative conjugated to a polymer comprising SEQ ID NO:3" as the structure of the protein and the structure of the conjugate cannot be the same.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 3-4, 16, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuriyama et. al. (U.S. Patent No. 6,500,646, December 31, 2002), based

on the broad recitation of a thrombomodulin protein derivative and a thrombomodulin protein derivative- polymer comprising SEQ ID NO:3 and a substitution of a leu for a met anywhere in the structure.

Kuriyama et al. discloses a protein structure that comprises SEQ ID NO:3 of the instant application. The structure taught by the reference has a substitution of a leu for a met. Although the reference is silent on a thrombomodulin protein derivative/conjugate as the structure in the art and the instant application are 98% identical the activity is an inherent property and the patented protein can be construed as an "EGF-like protein". In addition, the claims recite the same structure for the protein as well as for the conjugate; the conjugate is a polymer which can be a protein; and the patented structure is longer than the 147 residues in SEQ ID NO:3, thus could be construed as possessing a conjugate, thus the reference anticipates the claimed invention. Therefore, the limitations of the claims are met by the reference.

### ***Response to Arguments***

9. Applicant's comments have been considered in full, but are not persuasive. Withdrawn rejections/objections will not be addressed herein as applicant's comments are moot. Note that the rejection under 35 USC 112, first paragraph, written description remains and has been amended for the reasons set forth above and herein. Applicant states that the independent claim recites SEQ ID NO:3, thus it is believed that the rejection is obviated. The rejection remains because the claims now recite a substitution of leu for met and there is no indication of where in the structure this will

occur. It is noted that only one met residue is recited in SEQ ID NO:3 which is at position 147, however, the instant specification discloses that position 388 has a substitution of leu to met, however, SEQ ID NO:3 only has 147 residues, thus the claimed invention lacks adequate written description. Further, note that a new ground of rejection has been instituted under 102 (b) for the reasons set forth above.

***Conclusion***

10. No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hope A. Robinson whose telephone number is 571-272-0957. The examiner can normally be reached on Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, can be reached at (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Hope A. Robinson/

Primary Examiner, Art Unit 1652

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